

What is claimed is:

1 1. An actuator comprising:
2 a displacement element for generating a specific
3 displacement;
4 a displacement expander for transmitting the
5 displacement of said displacement element and expanding the
6 displacement;
7 a transmitter for transmitting the displacement expanded
8 by said displacement expander to a driven member; and
9 a presser for pressing said transmitter against the driven
10 member,
11 wherein the oscillation of said displacement element is
12 restrained by the oscillation of said displacement expander.

1 2. An actuator as claimed in claim 1, wherein the
2 spring constant of said displacement expander is less than the spring
3 constant of said displacement element.

1 3. An actuator as claimed in claim 2, wherein said
2 displacement element is driven by a drive signal of a frequency near
3 the simple natural frequency of said displacement expander.

1 4. An actuator as claimed in claim 1, wherein said
2 displacement element is driven by a drive signal of a frequency near
3 the simple natural frequency of said displacement expander.

1 5. An actuator as claimed in claim 1, wherein said
2 displacement element is a laminate-type piezoelectric element.

1 6. An actuator comprising:
2 a first displacement element for generating a specific
3 displacement;
4 a second displace element for generating a specific
5 displacement of which a direction is cross to a direction of the specific
6 displacement of said first displacement element;
7 a first displacement expander, which is connected in series to
8 said first displacement element, for transmitting the displacement of said
9 first displacement element and expanding the displacement;
10 a second displacement expander, which is connected in series
11 to said second displacement element, for transmitting the displacement of
12 said second displacement element and expanding the displacement;
13 a tip member, which is arranged at an intersection end of said
14 first and second displacement elements, for transmitting the displacement
15 expanded by said first and second displacement expanders to a driven
16 member; and
17 a presser for pressing said tip against the driven member,
18 wherein the oscillation of said first and second displacement
19 elements are restrained by the oscillation of said first and second
20 displacement expanders.

1 7. An actuator as claimed in claim 6, wherein the
2 spring constants of said first and second displacement expanders is
3 respectively less than the spring constants of said first and
4 displacement elements.

1 8. An actuator as claimed in claim 7, wherein said first
2 and second displacement elements are respectively driven by drive
3 signals of a frequency near the simple natural frequency of said first
4 and second displacement expanders.

1 9. An actuator as claimed in claim 6, wherein said first
2 and second displacement elements are respectively driven by drive
3 signals of a frequency near the simple natural frequency of said first
4 and second displacement expanders.

1 10. An actuator as claimed in claim 6, wherein said first
2 and second displacement elements are respectively a laminate-type
3 piezoelectric elements.